780

A SAFE AND EASY REMEDY

PROPOSED FOR THE RELIEF OF

THE STONE AND GRAVEL,
THE SCURVY, GOUT, &c.

AND

FOR THE DESTRUCTION OF WORMS
IN THE HUMAN BODY,

ILLUSTRATED BY CASES:

TOGETHER WITH

AN EXTEMPORANEOUS METHOD OF IMPREGNATING WATER, AND OTHER LIQUIDS, WITH FIXED AIR, BY SIMPLE MIXTURE ONLY, WITHOUT THE ASSISTANCE OF ANY APPARATUS, OR COMPLICATED MACHINE.

BY NATHANIEL HULME, M. D.

OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON:
PHYSICIAN TO THE CHARTERHOUSE, &c.

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MVSEVM
BRITAÑ
NICVM

TO THE MOST NOBLE

HUGH,

DUKE OF NORTHUMBERLAND,

KNIGHT OF THE MOST NOBLE

ORDER OF THE GARTER;

THIS TREATISE

IS,

WITH THE GREATEST RESPECT,

INSCRIBED,

BY HIS GRACE'S

MOST OBEDIENT AND

MOST HUMBLE SERVANT,

Charterhouſe-Square,
Jan. 10th, 1778.

NATHANIEL HULME.

INTRODUCTION.

WHEN a new remedy is propoſed, it requires a long time, and a multiplicity of experiments, to aſcertain its true virtues. What a number of years elapſed, before the Peruvian bark was well known to phyſicians, and how much did they differ in their accounts; ſome highly extolling, and others as warmly condemning it! Cicuta, or Hemlock, has been in uſe, as a medicine, ſeveral years, yet its effects upon the human body, in thoſe diſeaſes for which it has been recommended, are far from being determined even to this day; ſome phyſicians holding it in high eſteem, whilſt others reject it as an uſeleſs drug. The author of the following obſervations humbly propoſes to the publick, the trial of a medicine, which he has lately found of ſervice in various diſeaſes; at the ſame time ingenuouſly owning, that he is not, as yet, fully acquainted how far its virtues may extend, or how be limited: under this reſtriction, therefore, he wiſhes, that what he has to advance on this head may be always underſtood by the candid inquirer. In the mean time humanity forbids him to conceal from the world what he conceives may, in any degree, alleviate maladies to which human nature is daily expoſed. The remedy which the author means to recommend, in this treatiſe, is Salt of Tartar, and weak Spirit of Vitriol, diluted with water, or ſome other liquid, to be taken ſeparately; or mixed together in a peculiar manner, which will be deſcribed hereafter in the ſixth ſection. The proportion of the vitriolic acid to the ſalt, is always ſuppoſed to be juſt ſufficient to ſaturate or neutraliſe the alkali; unleſs where it is differently expreſſed, or preſcribed. For this reaſon, it will be adviſable for the phyſician, before he orders this remedy, to be acquainted, by actual experiment, with the real ſtrength of the alkali and acid, intended to be made uſe of; otherwiſe a compoſition, quite different from what he deſigned, may be the conſequence.

A
SAFE AND EASY
REMEDY, &c.

SECT. I.

OF THE STONE AND GRAVEL.

Caſe of a calculous Patient.

THE hiſtory of this caſe I lately publiſhed in Latin, and annexed it to a former work, entitled, "*Oratio* "*de Re medica cognoſcenda & promovenda*[a]." But as it gave riſe to the preſent publication, and may not be unacceptable to the Engliſh reader, I will give a tranſlation of it in this place; and corroborate the method of cure, therein recommended, by further experience.

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[a] Pag. 44. & ſeq.

John Dobey, one of the poor Brothers of the Charterhouſe, aged ſeventy-three years, had been afflicted with ſymptoms of the ſtone in the urinary bladder, for the ſpace of three years. He frequently complained of violent pain in his loins, and a ſenſation of weight about the *pubes*; and felt pricking pains at the end of the *penis*, and in the region of the bladder. He had a difficulty in making urine, which came away by drops, and ſometimes involuntarily; it was high-coloured, and had a thick mucous ſediment. At theſe times he would, now and then, void a ſmall ſtone or two, of a round figure: but this happened very rarely. He was generally very coſtive. In the height of his fits, the pain was frequently ſo excruciating, that he could not forbear crying out in a moſt violent and lamentable manner, for whole days and nights together. He had not much thirſt, but his tongue and mouth, by his continual cries, became ſo dry and glutinous, as to cleave together.

Various were the means made uſe of for his relief, but without any effect; except for the preſent: inſomuch that his only hopes ſeemed to be placed in the operation adapted to this diſeaſe; to which, indeed, the miſerable patient, worn out with pain, had actually conſented. In ſuch a dilemma, what other alternative was left? I will relate the event of this caſe in a very few words.

What I had ſaid in the Oration[1], concerning elective attraction, and the power of fixed air, in diſſolving the *calculus* when out of the body, induced me to try what effect would be produced in this caſe within the body by a medicine which contained (as it were locked up within itſelf) a large quantity of fixed air. The patient, therefore, was ordered to take fifteen grains of Salt of Tartar, in three ounces of pure water, four times a day; and to drink, immediately afterwards, the ſame quantity of water, with twenty drops of weak Spirit of Vitriol: for I imagined, that theſe medicines, given ſeparately in this manner, would have their firſt conflict in the ſtomach, and would by this means more readily exert their full force, and be more quickly and powerfully conveyed through the whole body. A few days after this, I was greatly ſurpriſed to find, at the bottom of the urine, many ſtony fragments, and a whitiſh mucous ſubſtance, ſomewhat reſembling chalk and water. This whitiſh matter might likewiſe be plainly perceived adhering to the edges of the calculous fragments; as if itſelf had lately been part of a ſtone, but was now converted into a chalky ſubſtance. When dried and powdered, it was large in bulk, but ſpecifically light. The patient ſaid, that theſe ſtony concretions came away principally in the night, or in a morning. During the cure, he complained at times of heat and pain, about the neck of the bladder, and in the *urethra*; which to me ſeemed to ariſe from the irritation of ſo many hard rugged bodies paſſing that way. Accordingly the medicines were ordered to be omitted, for ſome time, and theſe complaints gradually diminiſhed. Afterwards the ſtony fragments were voided with more eaſe, and the quantity of whitiſh cretaceous ſubſtance daily increaſed. Thus the latent *calculus* ſeemed to come away, in a great meaſure, in the form of a whitiſh mucous chalky matter; and the fragments became, as it were, ſofter and leſs than at the beginning.

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[1] Pag. 11.

In the ſpace of a month, the patient voided above one hundred and eighty ſtony fragments, of different magnitudes: to ſay nothing of thoſe which were unavoidably loſt, whenever he had a call to ſtool. Theſe fragments were of a brown colour when moiſt; but put on a whitiſh appearance when dry. Some of them were compoſed of thin *laminæ*; others were more ſubſtantial. Each of theſe fragments was evidently a piece of a larger *calculus*; and had a convex and a concave ſurface: the former was ſmooth, and the latter rough.

After the patient had taken the medicines above mentioned about three weeks, the ſtony fragments came away with more eaſe, and he never had a return of a fit afterwards*. If at any time the body was coſtive, gently opening catharticks were adminiſtered; but, in general, the medicines above recommended, kept the body laxative and promoted urine.

No change was made in the patient's diet, he had water-gruel for breakfaſt and ſupper; and for dinner, whatever the table of the Charterhouſe afforded. His common drink was pure water, with a ſmall quantity of compound Juniper-water added to it; and now and then a glaſs of white wine was allowed him: but he very ſeldom complained of thirſt.

Extract of a Letter from COLIN HOSSACK, M. D. of Colcheſter, dated the 24th of Nov. 1777.

"SIR,

I have not been unmindful of your *ſolvent*; and within a week after I received your letter of the 24th of May, I recommended the uſe of it to four different patients, who were all affected with calculous complaints. Three of theſe patients live within ſix miles of this place, and were all greatly relieved in about ſixteen or ſeventeen days; particularly one, who having been ſubject to a continual micturition was in about ten days able to retain his urine for ſome hours, and voided at intervals, ſome ſand and ſmall pieces of *calculi*. The fourth patient, who lives at ſome diſtance from me, wrote to me by his Apothecary the 7th of laſt July; in which letter he tells me, "That Mr. B. had voided laſt ſaturday a great quantity of ſand of a brick-colour, which gave him great relief, and much ſatisfaction of mind. Two days before the gravel came away, he was in extreme pain, and unable to retain his water."

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* It is now almoſt a year ſince this patient received a cure; and he continues to enjoy a good ſtate of health. But I ſtill order him to take now and then, ſome of the medicine, by way of prevention.

I am, with great eſteem,

SIR,

Your moſt obedient ſervant,

COLIN HOSSACK.

To Dr. HULME, at the Charterhouſe, London.

By a Letter from Mr. HENRY KIPPING, Apothecary at Brighthelmſtone, dated Dec. 2, 1777, I am informed that ELIZABETH CROUCH, an Inhabitant of that town, has found great relief, in a nephritick complaint, from the uſe of the remedy here recommended. That ſince taking the medicine, which ſhe has done regularly for five months, ſhe has had only one fit, which continued but a ſhort time; and that ſhe has voided, at different periods, many ſmall ſtones, one of which was conſiderably larger than the reſt.

In nephritick complaints alſo, ariſing from arenaceous gravel, I have frequently obſerved, that this remedy has had happy effects.

W. P. aged twenty-ſix years, complained of a pain in his loins, and a difficulty in making urine, which had troubled him at times for four years. His evacuations were regular, but his urine was high-coloured. He had loſt his appetite, was feveriſh, and had a cough. Bleeding and pectoral medicines removed his fever and cough. He then took fifteen grains of Salt of Tartar, diluted with three ounces of pure water, four times a day; and drank immediately afterwards the ſame quantity of water, impregnated with as much weak Spirit of Vitriol as was ſufficient to ſaturate that quantity of alkali. After taking this remedy, two or three days, he made urine more freely and oftener than uſual, and voided much red gravel, and was ſoon relieved from his nephritick complaints.

E. M. a girl eleven years of age, after a tedious fever, was ſubject to an incontinency of urine for ten weeks. She had a pain in making water, and the urine was of a flame-colour. She took the remedy, as in the former caſe, for three or four weeks; during which time ſhe parted with much red gravel, the ſtrangury left her, and ſhe retained her urine as uſual.

A. N. aged forty, in the fourth month of her pregnancy, complained of a pain in her loins, attended with nephritick ſymptoms and coſtiveneſs. A gentle cathartick was firſt adminiſtered, and then ſhe was ordered the lithontriptick remedy, as laſt mentioned, which ſhe continued to take for about three weeks. She voided much arenaceous gravel, of a red colour, and got perfectly well.

J. W. a young man, was affected, after making urine, with a pain in the *urethra*, and ſometimes at the end of the *penis*; together with a great heat in his loins, eſpecially on uſing exerciſe. He was ſometimes looſe, at other times coſtive, and had little appetite, but his pulſe was regular. He was ſubject to the gravel, which was of the red arenaceous kind. He took the lithontriptick remedy, as in the three former caſes, four times a day, for the ſpace of three weeks, and the calculous ſymptoms were removed.

Great care ſhould be taken, in calculous complaints, that the medicines preſcribed be pure and genuine; eſpecially the Salt, which ſhould be freſh and dry. And let it be remembered once for all, that both the Salt of Tartar, and the weak Spirit of Vitriol, in all caſes where they are recommended in this treatiſe, are meant by the author, to be ſtrictly prepared according to the directions given for them in the London Pharmacopœia; otherwiſe the effects expected from them may be fruſtrated. It may not be amiſs alſo to obſerve, that diſtilled water, when it can be had, ſeems preferable to common water, in calculous diſeaſes, for diluting the medicines above mentioned.

SECT. II.

OF THE SCURVY.

I Have treated expreſſly in another place of this diſeaſe, ſo fatal to ſeamen[1]; but ſhall beg leave to add here ſome further inſtructions, relating to its cure.

D. M. aged fifty years, applied to me for relief in the month of April 1777. His countenance was ſallow and bloated. His gums were ſpongy and livid, and much ſwollen; his breath was highly offenſive. He had a difficulty of breathing on motion, was very weak, and complained

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[1] Libell. de Scorbuto. Lond. MDCCLXVIII.

of a wearineſs and ſtiffneſs in his limbs. His reſt was diſturbed. He was greatly affected by cold, eſpecially his mouth and face; ſo that when he went into the open air, he was always obliged to hold a handkerchief up to thoſe parts. His legs were hard and ſwelled; and ſome *cicatrices* he had thereon were of a livid colour. He had a multiplicity of ſmall livid ſpots, which ſpread over the fore arms and thighs. His gums were ſo very tender, that he could not eat any thing but what was very ſoft. After I had hit upon the method of giving the Salt of Tartar, and weak Spirit of Vitriol ſeparately, as in the caſe of JOHN DOBEY, I was fully perſuaded that the ſame method would cure the ſcurvy: and therefore gladly embraced this opportunity of trying its effects. Accordingly the patient was ordered to take fifteen grains of Salt of Tartar, in three ounces of water; and to drink immediately afterwards the ſame quantity of water, acidulated with as much weak Spirit of Vitriol as was ſufficient to ſaturate that quantity of alkali. Theſe were repeated four times a day. He had not taken theſe medicines more than five or ſix days, before he found his ſtrength increaſed, and the livid ſpots on the fore arms and thighs begin to die away; his gums were alſo more firm, and of a lively red. In two weeks he had no complaints remaining, except a little ſtiffneſs in his thighs after walking. There was no change made in the patient's diet; nor did he take any other medicines than thoſe now mentioned.

For

For cure of the Scurvy at Sea.

Take of pure Salt of Tartar one ounce (Troy weight) diſſolve it in ſixteen ounces of common water; and call it the *Alkaline Mixture*. Alſo, take of weak Spirit of Vitriol two ounces (in meaſure), of common water fourteen ounces, ſo as to make in the whole ſixteen ounces, to be called the *Acid Mixture*. Let the patient take half an ounce (in meaſure) of the *Alkaline Mixture*, in three ounces of common water, four times a day: and immediately afterwards let him take half an ounce of the *Acid Mixture* in the ſame quantity of water: and continue theſe medicines till all the ſcorbutick ſymptoms diſappear, and the patient's ſtrength be reſtored; which may be expected to happen in about the ſpace of three weeks. If occaſion ſhould require, the doſe may be increaſed to double the quantity. In this compoſition the acid, by deſign, is made predominant. Before the patient begins the courſe, he ſhould take a doſe of ſome gently cathartick medicine; and if the body ſhould be coſtive at any time during the courſe, it ſhould now and then be rendered gently laxative. It is hardly neceſſary to mention that the patient, while under cure, ſhould be confined as much as poſſible to the vegetable part of the ſhip's diet.

For prevention of the Scurvy at Sea.

If theſe medicines were given only twice or thrice a day, to a ſhip's crew, or any part thereof inclined to the ſcurvy, I am apt to think that the diſeaſe might be prevented from increaſing, or be entirely removed. Or whenever the whole ſhip's crew is in danger of being attacked with the ſcurvy, let the water which is uſed by the ſeamen for their common drink, be daily impregnated with the alkaline ſalt and vitriolick acid in the manner deſcribed in the ſixth ſection of this treatiſe.

I ſhall conclude this part of my ſubject by obſerving, that the medicines which are here recommended, ſeem to be excellently adapted to the marine ſervice, as alſo to the uſe of the army. They lie in a ſmall compaſs, are very cheap, and preſerve their virtues entire for many years; nor are they liable to change by any climate whatever. Their virtues are highly concentrated, and moreover they have this further excellence, that they require no preparation, but are quickly ready for uſe. In a word, the author cannot but recommend them to the particular notice of thoſe who preſide over our naval and military affairs.

SECT. III.

OF THE GOUT.

WHAT firſt induced me to give the above-mentioned remedy to perſons liable to the gout, was a converſation I had on this ſubject, ſome time ago, with an ingenious friend; who told me he had long entertained an opinion, that the chief cauſe of that diſeaſe is a retention of too much fixed air in the body, which ought to be diſcharged, chiefly by the pores of the ſkin. Hence the gout, ſaid he, is more prevalent, *cæteris paribus*, in cold than in warm climates; in ſedentary perſons, than in thoſe who uſe much exerciſe. Hence alſo the luxurious and athletick man will be peculiarly ſubject to this complaint, from his high mode of living, and drinking plentifully of ſuch liquids as abound with fixed air; ſuch as wines of various kinds, malt liquors and cyder. He obſerved, at the ſame time, that Dr. MACBRIDE, in his Experimental Eſſays, was the only author he had met with, who had thrown out a hint of this kind. This opinion ſeemed very plauſible and ingenious. The difficulty then was how to come at the fact by experiment. After ſome reflection I imagined, that if a medicine abounding with fixed air, were given daily for a length of time to perſons greatly ſubject to the gout, it would bring the matter to a pretty full proof. For if the diſeaſe was really owing to fixed air, then this method ſhould increaſe the malady, and bring on gouty complaints; but on trial it ſeemed to have had quite the contrary effect, as far as a judgment may be formed from the two following caſes.

R. J. aged ſeventy-two years, of a robuſt habit of body, had been ſubject to the gout twenty-nine years. He ſometimes had a fit twice a year, but always once, and that commonly in the Autumn. It generally continued upon him one, two, or three months. The firſt joint of the great toe, in one, or both feet, was the part principally affected. Sometimes his head, ſometimes his ſtomach, ſuffered. The diſorder alſo fell upon the joints of the fingers, and would frequently affect the whole hand. By repeated attacks of this kind, he has quite loſt the uſe of ſeveral joints of the fingers. He is ſubject to no other complaint, and in general, his appetite is very good, and he uſes a moderate degree of exerciſe. He took the medicine daily, for half a year together. The quantity, for the firſt three or four months, was fifteen grains of Salt of Tartar, three times a day, diluted with three ounces of pure water; taking immediately afterwards the ſame quantity of water, acidulated with as much weak Spirit of Vitriol as would ſaturate that portion of alkali. He then took double the quantity of the alkali and acid, mixed together in a peculiar manner, which will be deſcribed hereafter; but only repeated it night and morning. The medicine in both forms agreed with him perfectly well through the whole courſe; and he enjoyed a better ſtate of health, after he began to take it, than he had done before for many years paſt. The gout did not in the leaſt return this laſt Autumn.

J. M. aged fifty-ſix, had been afflicted with the gout ten years. The fit generally came on in the month of January or February, and continued three or four weeks; but the laſt paroxyſm he had, held him thirteen weeks. The great toe was the part principally affected, which firſt grew painful and inflamed, then ſwelled; but as the tumor increaſed, the pain was alleviated. The pain was more ſevere in the night than in the day. The diſorder ſeldom affected both feet at the ſame time, but firſt one and then the other. The ſkin during the fit, was generally hot and dry; and the body coſtive. This laſt year both his hands were greatly affected, but chiefly the right; and a cretaceous concretion formed in the middle joint of the ring-finger of the right hand. He took the medicine daily, as in the laſt mentioned caſe, for the ſpace of four months, and obſerved that it gave him unuſual ſpirits; and he has had no gouty complaints ſince.

Future experience alone muſt determine how far this remedy may ſucceed againſt this diſeaſe, which is generally called the *opprobrium medicorum*. But is there no cure for the gout? Let phyſicians endeavour at leaſt to find out a remedy. For my part, I am rather inclined to think that there is a remedy in nature, (and perhaps generally of the moſt ſimple kind) not only for the gout, but for moſt diſeaſes where the *viſcera* are ſound, the vaſcular ſyſtem pervious, and the body not worn out with age. How dreadful and ſudden, for example, are the effects of the poiſon ariſing from the bite of a viper! yet a little oil proves its certain antidote. What a loathſome and corroding diſeaſe is the *lues venerea*! but a ſmall portion of mercury can ſubdue all its virulence. What a change does the ague make upon the human body! a ſudden coldneſs and trembling ſeize every limb, ſucceeded by a burning fever and exceſſive thirſt: by repeated attacks the whole body becomes feeble and emaciated, the countenance pale, ſickly, and dejected; notwithſtanding which, give but the bark of a certain tree, and the patient is ſoon reſtored to his former health. Look upon the mariner, juſt arrived from a tedious voyage, labouring under the ſcurvy; his legs are ſwelled and contracted; his countenance is ſallow and bloated; his breath is horribly offenſive; his gums are ſwelled and putrid; his teeth are looſened from their ſockets; and his limbs are diſcoloured with livid ſpots; nevertheleſs, in pot-herbs and fleſh-broths, the common food of man, he finds an infallible cure! So ſimple and wonderful are the operations of nature, could we but always find them out.

SECT. IV.

OF HECTICK FEVERS, WITH CONSUMPTION.

I Have frequently given the remedy above deſcribed in hectick fevers, attended with pulmonary complaints, and I think with ſome ſucceſs; and therefore recommend it, for future trial, to the judicious practitioner.

J. A. aged thirty-five years, had been afflicted with a violent cough ten months. He expectorated a thick yellowiſh matter and had a hectick fever, accompanied with a *diarrhœa*, which laſt had been upon him half a year. An emetick was firſt adminiſtered, and then a gently opening medicine; at the ſame time a veſicatory was applied between the ſhoulders. After which he took fifteen grains of Salt of Tartar in three ounces of water, four times a day; and immediately afterwards the ſame quantity of water, with as much weak Spirit of Vitriol as was ſufficient to ſaturate the alkali: theſe he continued twenty-one days, without any other remedies, and his complaints were removed.

M. W. nineteen years of age, complained of a violent cough, which had tormented her two months. Her expectoration was ſometimes yellowiſh, or greeniſh, and ſometimes bloody. She had a pain at the pit of her ſtomach, and in her right ſide. Her body was regular, and the *menſes* appeared at the ſtated times; but her pulſe was quick and weak. She was thirſty, and had loſt her appetite. She complained of frequent ſhiverings, followed by feveriſh heats; and had been afflicted with night-ſweats for two months. She took the alkali and the acid, as in the former caſe, and in three weeks ſhe thought herſelf well.

G. W. aged thirty-nine years, had been troubled with a violent cough ſix weeks, ſpitting up a yellowiſh thick phlegm. He had a pain at the pit of his ſtomach, and in his left ſide, which had afflicted him for three weeks; attended with a difficulty of breathing, on motion. His evacuations were regular, but his appetite failed him, and he was thirſty. He had a hectick fever, accompanied with night-ſweats. Beſides the common remedies for his cough, he took the medicines, as in the two former caſes, about a month, and found great relief from them.

J. S. in the twenty-fifth year of his age, laboured under a violent cough, and expectorated a thick greeniſh matter. He had a hectick fever, with a quick weak pulſe, and a pain in the epigaſtrick region. His body was coſtive, he had loſt his appetite, and frequently vomited up his food. The aboveſaid remedy was adminiſtered to him three times a day, for two or three weeks ; the fever abated, his appetite returned, and the vomiting was reſtrained. Pectoral medicines were uſed at the ſame time, on account of the cough.

Of Fevers in general.

The ſame remedy has been found uſeful in putrid and other fevers, eſpecially at the beginning, after the neceſſary evacuations have been made. In febrile diſeaſes, in general, I recommend the alkali and the acid to be given in a combined ſtate, in a peculiar manner, which will be ſhewn in the ſixth ſection. And where the Peruvian bark is indicated, a decoction of that celebrated febrifuge may be medicated with them in the ſame manner.

To illuſtrate this by an example: A girl aged twelve years, was ſeized with a fever and great difficulty of ſwallowing, together with a ſcarlet efflorescence which covered the whole body. The ſkin was dry, and impreſſed upon the touch a diſagreeable biting heat. There was great thirſt, but the tongue was clean and of a lively red, and the patient diſcharged much phlegm from the throat. A painful tumour fixed on the ſide of the neck, a little below the ear, but did not come to ſuppuration. The eyes were greatly inflamed, and there was almoſt a conſtant *delirium*, with a very quick weak pulſe. A dry tickling cough attended, and the body was rather coſtive. The chief remedy, in this caſe, was a decoction of the bark of Peru, impregnated with Salt of Tartar and weak Spirit of Vitriol as deſcribed hereafter, which was frequently repeated, and with apparent advantage.

Of the Dyſentery.

This medicine, aſſiſted with other helps, according to the different indications, bids fair for relieving the dyſentery, and ſome kinds of *diarrhœa*.

M. D. twenty-two years of age, complained of much pain below the navel, which had continued four months;

and was accompanied with mucous ſtools ſtreaked with blood. Her *menſes* were regular. She was feveriſh, and had a quick weak pulſe, with frequent ſhiverings; and alſo complained of a pain in the back part of the head. Evacuants were firſt made uſe of, and then this remedy was given three times a day, as an antiſeptick. The patient found herſelf greatly relieved by it, and the diſorder was ſoon after removed.

SECT. V.

OF WORMS.

THE human body is frequently infeſted with worms of various kinds, which not only prove troubleſome, but are ſometimes attended with dangerous conſequences. Children are particularly ſubject to theſe verminous animals, which irritating their tender and delicate frames, induce a multiplicity of complaints, ſome of which prove fatal. And what adds to the misfortune of infants is, that moſt of the remedies which are recommended for the deſtruction of worms, are either harſh in their nature or violent in their operation. How many lives have fallen a ſacrifice to anthelminthick cakes, worm-killing powders, and draſtick purges ! If a medicine then could be hit upon, for the deſtruction of worms, which would be perfectly ſafe and agreeable to the infantile ſtate, it would be a real acquiſition to the *materia medica*. The remedy, which is here recommended, promiſes to be ſuch, being merely a watery fluid ; and yet it ſeems very pernicious to theſe animals, and alſo to aquaticks ; even the lively eel cannot withſtand its deleterious power, though in its own element : at the ſame time it is, as far as I have obſerved, perfectly harmleſs to the human body.

S. P. a ſingle woman, aged thirty, had been ſubject to hyſterick complaints for ſome years. Among various other ailments, ſhe had a troubleſome pain at the ſtomach, and below the navel, and was of a coſtive habit of body, but had her *menſes* regularly. She was miſerably tormented with worms, reſembling earth-worms, about four or five inches long ; which ſeemed to poſſeſs the whole inteſtinal canal. She voided them alive, ſometimes by the mouth, ſometimes downwards, and ſometimes they came away along with the urine, (without any motions to ſtool) which induced both her and her mother to ſay, that they came from the bladder. And what ſeemed to confirm them in their opinion was, that before the worms came away with the urine, a violent ſtrangury always preceded, and a dragging-pain (as ſhe termed it) from the navel downwards; and immediately after the worms were evacuated ſhe was eaſier. She had taken a variety of medicines for her general complaints, by the advice of other phyſicians as well as myſelf, without much relief. I then thought of preſcribing the alkali and the acid, in the manner above mentioned, on account of the ſtrangury. Theſe ſhe took four times a day, and after a few days ſhe obſerved ſeveral worms to be emitted by ſtool, but remarked that they were all dead; whereas before this time they came away in a living ſtate. By purſuing this plan for a few weeks, and interpoſing now and then a cathartick, ſhe voided no more worms, and recovered a better ſtate of health than ſhe had enjoyed for a long time. This caſe induced me to make the two following experiments.

EXPERIMENT I.

I impregnated a quantity of river water, with the alkali and the acid, by a peculiar method which will be deſcribed hereafter, and threw into the liquor a common earth-worm. It immediately coiled itſelf up, and twiſted about, ſhewing the greateſt ſigns of uneaſineſs, till it died, which happened in a very ſhort ſpace of time. After it was dead, a number of air-bubbles collected upon its whole ſurface, and buoyed it up to the top of the liquor. This experiment was often repeated. If a worm was taken up by its middle, upon a piece of ſtick, and held over the water, ſo as juſt to touch it, the animal would directly jump up, and ſhow great dread of the liquor.

EXPERIMENT II.

I was then deſirous to know whether aquatick animals could live in this water. To make the experiment the more complete, I fixed upon the eel as a fiſh the moſt tenacious of life. As ſoon as it was thrown into the impregnated water, it ſwam briſkly round the ſide of the veſſel which contained it, as if in ſearch of a purer element; but finding none, it ſhowed greater ſigns of uneaſineſs, by darting more briſkly through the water, and ſtruggling. After this its motion grew weaker and weaker, till it became to all appearance dead; which happened in a few minutes. The ſtruggling at the latter-end was ſo violent, in one or two inſtances, that the fiſh leaped quite out of the veſſel; but this agitation does not always happen. Sometimes the fiſh, before it dies, turns itſelf on its back and ſwims about in that poſture. After the eel becomes motionleſs, if it be kept in the impregnated water for ſome time, it inevitably dies; but if it be taken out ſoon after it has loſt all powers of motion, it will generally revive. And the firſt ſigns of life are a ſwelling about the gills, and a burſting out of air-bubbles from thence.

The manner of medicating water, for the deſtruction of worms, may be learned by conſulting the fourth experiment in the following ſection. This water may be given freely to drink as an anthelminthick; and may alſo be injected into the inteſtines, for the ſame purpoſe, as occaſion requires. In this laſt caſe, and in all other inſtances where warm water is neceſſary, the water ſhould always be heated firſt, and then reduced to its proper degree of warmth for the intended uſe, before it be medicated; otherwiſe a large quantity of the volatile part will evaporate by the action of the fire.

SECT. VI.

EXTEMPORANEOUS METHOD OF IMPREGNATING WATER, AND OTHER LIQUIDS, WITH FIXED AIR.

THE ingenious Dr. PRIESTLEY, in the account of his method of impregnating common water with fixed air, expreſſes himſelf in the following words: “Though what I have done in this buſineſs has certainly the leaſt merit poſſible with reſpect to *ingenuity*, I ſhall always conſider it as one of the *happieſt* thoughts that ever occurred to me; becauſe it has proved to be of very ſignal *benefit* to mankind, and will, I doubt not, be of much more conſequence in a courſe of time[a]."

His *apparatus* conſiſted of a glaſs veſſel filled with water, which was then inverted and placed in another veſſel, in the form of a bowl or baſin, with a little water in it. To theſe was added a flexible pipe, fixed to a bladder; the latter of which had one end tied round a perforated cork, and the hole kept open by means of a quill. The cork was fitted to a phial, two-thirds of which was filled with chalk, juſt covered with water. When in uſe, a little oil of vitriol was poured upon the chalk and water, which preſently ſet at liberty a conſiderable quantity of fixed air, that diſtended the bladder; and this being preſſed, the air forced its way through the pipe, and aſcended into the glaſs veſſel of water; the water of which, at the ſame time, deſcended and came into the baſin. The ſeveral parts of this *apparatus* are delineated in his Experiments and Obſervations on different kinds of air. Vol. II. pag. 263.

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[a] Experim. and Obſerv. on different kinds of air. Vol. II. pag. 269.

Another *apparatus*, for the impregnation of water with fixed air, made entirely of glaſs, was afterwards invented by Dr. NOOTH, and improved by Mr. PARKER, which is the kind now generally made uſe of, and which, for diſtinction's ſake, we will call the *glaſs apparatus*. This is alſo repreſented by a drawing in PRIESTLEY'S Obſervations on Air. Vol. II. pag. 302.

I have, for ſome time paſt, been in poſſeſſion of a method of impregnating water with fixed air, *by ſimple mixture only*, without the aſſiſtance of any *apparatus*. What firſt led me to this method, was my manner of giving the Salt of Tartar and Spirit of Vitriol ſeparately, for the cure of the ſtone, as mentioned above in the caſe of JOHN DOBEY. For obſerving that the patient, when he took thoſe medicines, did not complain of any unuſual ſenſations in the ſtomach, which I imagined would have ariſen from the ebullition or diſcharge of air by the conflict of the alkali and acid, when they met together in that ventricle, I was curious to know how they acted on each other out of the body. For this purpoſe I was led to make the following experiments.

EXPERIMENT I.

Fifteen grains of Salt of Tartar were diſſolved in three ounces of river water, and put into an eight-ounce phial;

to this were added gradually, three ounces of the ſame kind of water, acidulated with as much weak Spirit of Vitriol as was ſufficient to ſaturate that quantity of alkali : but no ebullition enſued, as might have been expected ; yet I could perceive a ſmall inteſtine motion to take place through the whole body of water. The compoſition taſted acidulous, ſimilar to water impregnated with fixed air, by means of the *glaſs apparatus*. On ſhaking the liquor in the phial ſomewhat briſkly, a quantity of air was immediately diſcharged from it.

EXPERIMENT II.

To know whether the air, which was diſcharged from the liquor by ſhaking, was fixed air, I put ſix ounces of the ſame kind of liquor into a ſeven-ounce phial, and into another phial of five ounces, I put four ounces of lime-water ; then inſerting a bent glaſs tube into the neck of each phial, ſecured by a proper luting, I applied heat to the phial containing the water, impregnated with the Salt of Tartar and Spirit of Vitriol. As ſoon as the heat took effect, ſtreams of air-bubbles roſe plentifully from the whole body of water, which paſſing over, by means of the bent tube, into the lime-water, ſoon cauſed it to grow turbid and milky, and to precipitate a white ſubſtance. The phials were then removed, and when the turbid mixture had ſtood long enough to allow the precipitate all to ſubſide, I poured off the clear, and dried the ſediment, which appeared like powdered chalk, and effervesced violently with Spirit of Vitriol. This experiment was repeated ſeveral times.

EXPERIMENT III.

Six ounces of the water, impregnated with the Salt of Tartar and Spirit of Vitriol, as in the firſt experiment, were expoſed to the heat of boiling water, for an hour or upwards: by this means the water loſt its pleaſant acidulous taſte, and became vapid; and being added to lime-water, it made no impreſſion upon it.

EXPERIMENT IV.

I then increaſed the quantity of Salt of Tartar, in the proportion of half a drachm to three ounces of water; adding three ounces of water, acidulated with as much weak Spirit of Vitriol as would ſaturate the alkali, as in the firſt experiment. The mixture was made very gradually, and with great caution, to give as little motion to the two liquors as poſſible. During the mixture a great number of very ſmall air-bubbles formed throughout the whole body of the liquor, and roſe gradually to the top. The water taſted very briſk and acidulous, and ſparkled when poured out of one glaſs into another. On ſhaking the phial ſtrongly, a large quantity of air was diſcharged; and by continuing this operation for ſome time, the briſk acidulated taſte gradually evaporated. Heat applied to the phial had the ſame effect. This air alſo precipitated lime-water, in the ſame manner as in the ſecond experiment, but much more powerfully. The more ſlowly and carefully the mixture of the alkaline and acid liquors are made, in this experiment, the more ſtrongly will the water be charged with fixed air: for this reaſon it is beſt to let the ſecond liquor run gradually down the ſide of the veſſel, which is to contain them. From theſe experiments I conclude, that if an alkali and acid be diluted ſeparately with a *certain* quantity of water, and then gradually mixed together, they will act *ſilently* on each other; and that by this proceſs the fixed air of the alkali will be gently extricated from its baſis, and immediately diffuſe and incorporate itſelf into every adjacent particle of the water, till the whole fluid be fully ſaturated.

EXPERIMENT V.

To have ſome comparative idea of the quantity of air which water would imbibe by this method, and by that with the *glaſs apparatus*, the two ſubſequent experiments were made. Having filled a two-ounce phial with river water, impregnated with fixed air in the manner deſcribed in the laſt experiment, its mouth was covered with a piece of leather tied cloſely round its neck, and pierced with a hole in the middle. This hole was ſecured by a ſlip of bladder, faſtened alſo round the neck of the phial, which ſerved as a valve to let out air from the impregnated water, and to prevent any other fluid from entering. A wide mouthed phial, containing ten ounces, was then filled with water and inverted (its mouth being covered with a piece of moiſtened bladder) and placed over the neck of the two-ounce phial, which was previouſly put upright into a pan containing water more than ſufficient to cover it, and then the bladder was gently withdrawn. After this the pan was placed upon the fire, the two phials being kept upright in it, the water was gradually heated, and kept in a boiling ſtate the ſpace of one hour or more. By this proceſs, the air contained in the impregnated water of the two-ounce phial was expelled, and roſe up in air-bubbles through the body of water in the inverted phial, and lodged in the top part of the veſſel; the water deſcending in proportion to the quantity of air which aſcended. Before the *apparatus* was removed from the fire, a mark was made upon the inverted phial (or recipient of the air) as low as where the water had deſcended ; and after the veſſels cooled, the ſpace of the inverted phial, which the air had occupied, was filled with water, which being meaſured, was found equal to three ounces and two drachms.

EXPERIMENT VI.

The ſame experiment as the laſt was made with two ounces of water impregnated with fixed air, by means of the *glaſs apparatus*; and the quantity of air expelled was leſs by ſeveral drachms than with the Salt of Tartar and Spirit of Vitriol, as in the former experiment. Theſe two experiments were frequently repeated, and their reſults found very unequal, though both made at the ſame time and in the ſame pan, the quantity of air expelled differing greatly at different times ; but in every inſtance, the water impregnated with the Salt of Tartar and Spirit of Vitriol produced the largeſt quantity of air.

EXPERIMENT VII.

By the fourth experiment we may learn how to impregnate common water very ſtrongly, and extemporaneouſly, with that fine volatile principle ſo much admired in Pyrmont, Spa, Seltzer, and other mineral waters. Six ounces of

Pyrmont water were expoſed to the open air, and the phial which contained it was frequently and violently agitated, till its volatile ſpirit was evaporated; then Salt of Tartar and Spirit of Vitriol were added, as directed in the fourth experiment, and it immediately recovered a briſk acidulous taſte, and a ſparkling quality.

EXPERIMENT VIII.

One grain of ſalt of ſteel was thrown into a pint, or ſixteen ounces, of river water thus impregnated; the ſalt quickly diſſolved, and imparted a chalybeate property to it; by which means it reſembled thoſe mineral waters which abound with fixed air and iron. I then thought of impregnating ſome natural chalybeate water with this volatile principle, by means of the alkali and acid. For this purpoſe I viſited the chalybeate ſprings at Hampſtead and Iſlington, and made the experiment at the wells. The waters, by this proceſs, immediately acquired a pleaſant briſk taſte, and ſparkled when poured out of one glaſs into another. This is an eaſy and elegant method of communicating the fine volatile ſpirit to the chalybeate waters at Tunbridge, and in other parts of England; and perhaps thereby of rendering them equal in virtue, in many caſes, to thoſe at Pyrmont and Spa.

By previouſly knowing the principal contents of various mineral ſprings, the phyſician may be enabled to imitate them with a great degree of accuracy, and ſometimes even improve their virtues. Artificial mineral waters have this further advantage, that their medicinal powers may be varied according to the conſtitution of the patient, and the circumſtances of the diſeaſe. Sometimes, for example, it may be neceſſary that an alkali ſhould be predominant, ſometimes an acid; at other times a perfectly neutral ſalt may be moſt proper; ſometimes alſo the vegetable alkali, ſometimes the foſſil, may be uſed to advantage. A chalybeate property, in mineral waters, may be very beneficial in ſome caſes; in others it may be injurious: and theſe inconveniences frequently happen in the natural mineral waters; but in compoſing the artificial we may vary them at pleaſure, by adding what may be proper for the patient's complaint, and leaving out what might be improper. The intelligent reader will obſerve that, in the impregnation of water, and other fluids, with fixed air, by means of an alkali and acid, a portion of neutral ſalt is always generated at the ſame time.

EXPERIMENT IX.

Being now fully ſatisfied that water might be highly impregnated with fixed air, *by ſimple mixture only*, I proceeded to apply it to other liquids. Half a drachm of Salt of Tartar was diſſolved in three ounces of a decoction of Peruvian bark; to this were gradually added three ounces of the ſame decoction, acidulated with as much weak Spirit of Vitriol as was ſufficient to ſaturate the alkali. The mixture taſted ſubacid and agreeable. I eſteem this as an excellent remedy in putrid fevers, and other diſeaſes where the bark and antiſepticks are indicated. Cordials may be added at pleaſure, as occaſion requires.

EXPERIMENT X.

A mixture was made, conſiſting of three parts water and one of rum. Half a drachm of Salt of Tartar was then diſſolved in three ounces of this liquor, and an equal quantity of the ſame liquid was gradually added, being firſt acidulated with as much weak Spirit of Vitriol as was ſufficient to ſaturate the alkali. The compoſition acquired, by this means, a briſk lively taſte, quite different from that ardent one which rum and water ſimply have without this addition. Brandy and water were treated in the ſame manner, and nearly with the like ſucceſs.

EXPERIMENT XI.

Equal quantities of Madeira wine and water were mixed together, and medicated, as in the preceding experiment; the compoſition taſted pleaſant and acidulous, and ſparkled when poured into a wine glaſs. Several other kinds of wine were tried, and acquired the ſame properties.

EXPERIMENT XII.

A friend of mine having ſome Champaigne wine which had not any ſparkling quality, three ounces of it were alkalizated with half a drachm of the Salt, and the ſame quantity was acidulated with the vitriolick Spirit; they were then added together very cautiouſly, and the wine immediately recovered a ſprightly briſk taſte, and ſparkled much when poured out of one glaſs into another.

EXPERIMENT XIII.

Cyder and Perry were expoſed to the open air till they had loſt their volatile pungent taſte; they were then treated as in the laſt experiment, and they directly acquired the ſame kind of fine ſparkling ſpirit as the Champaigne wine juſt mentioned.

EXPERIMENT XIV.

Ale was kept in an open veſſel till it had loſt its ſpirit, and was become vapid. To ſix ounces of this liquor were added the alkali and acid, as above directed, and by this means it recovered a bright amber colour, mantled, and taſted fine and briſk; and when poured into a glaſs, formed a ſtrong flowery head, like a freſh bottle of old ale. The ſame experiment was made with ſmall beer, and with the ſame effect, in ſome degree. If officers in the army and navy were always to ſupply themſelves with a quantity of the alkali and acid, in time of war, theſe might probably be often of the greateſt utility to them in correcting bad liquors, which they are frequently obliged to make uſe of; for they appear by theſe experiments to have a power of meliorating both aqueous, ſpirituous, vinous, and other potable liquids. Theſe medicinal ingredients ſeem to claim the particular attention of thoſe perſons whoſe lot it is to viſit the unhealthy parts of the Eaſt and Weſt-Indies, or of the coaſt of Guinea; as they may help to purify the corrupted waters of theſe countries, and deſtroy the noxious *animalcula* with which they abound[1]. In ſuch peſtilential climates, perhaps it may be of the utmoſt conſequence to ſtrangers for the preſervation of health, to medicate with the alkali and acid not only the water, but all their liquors. And if they ſhould be uſed daily, on theſe occaſions, in the common drink, then a ſmall proportion of each to a large quantity of liquid will be ſufficient.

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[1] Vid. pag. 24.

EXPERIMENT XV.

Among other liquids, I was very deſirous of impregnating milk with the alkali and acid; and after making ſome trials, I at laſt happily ſucceeded. Half a drachm of Salt of Tartar was firſt diſſolved in a pint of *cold* milk; then one ounce of water, acidulated with as much weak Spirit of Vitriol as would ſaturate the alkali, was cautiouſly added. The milk, by this means, did not coagulate, but contracted a grateful ſubacid taſte, very much reſembling that of butter-milk. This gave me great pleaſure, as it promiſes to be of great uſe in conſumptive caſes, and other complaints, where a nutritive and antiputreſcent diet is required. In ſome nephritick maladies alſo, it may prove very beneficial; eſpecially where there is any hæmorrhage or ulceration, as it is a ſoft healing diuretick, and may be taken by way of diet. It may poſſibly be of great ſervice likewiſe in the gout, if taken regularly every day for breakfaſt and ſupper. In various diſeaſes incident to children it alſo promiſes great ſucceſs, and particularly in worm-caſes; as may be collected from what has been ſaid in the foregoing pages.

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